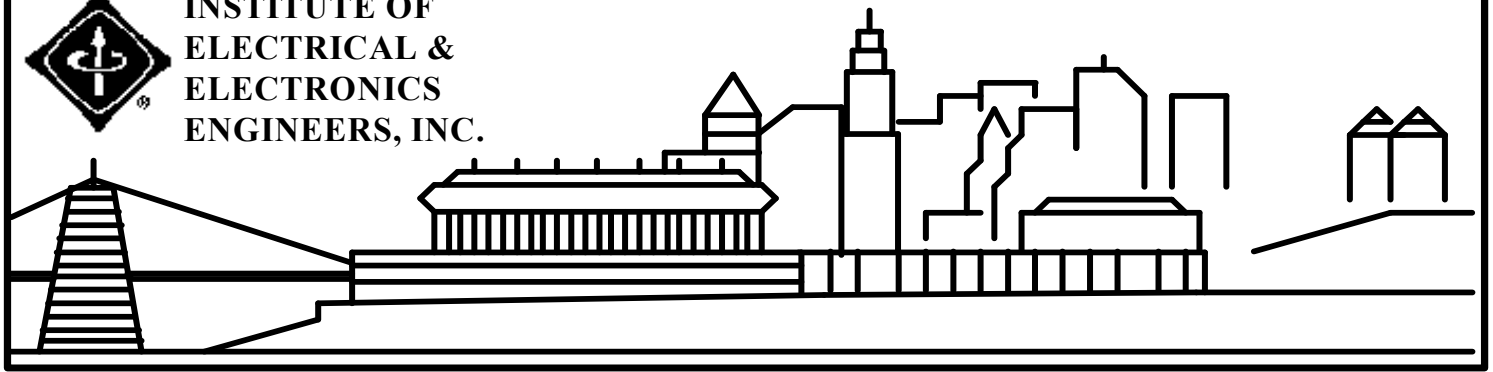




**INSTITUTE OF
ELECTRICAL &
ELECTRONICS
ENGINEERS, INC.**



FEBRUARY 1996

IEEE CINCINNATI SECTION NEWSLETTER

**The
ENGINEERS and SCIENTISTS of CINCINNATI (ESC)
invites you to attend the
61st ANNUAL MEETING
the highlight of ENGINEERS WEEK
to be held on Thursday, February 22, 1996
at the Metropolitan Club (50 E. RiverCenter Blvd., Covington, KY)**

6:00 P.M. Social Hour

7:00 P.M. Dinner: Cost \$30 - Reservation/check received by 2/10/96
 \$35 - paid evening of event.

8:00 P.M. Presentation of Awards:

Distinguished Engineer of Cincinnati
Distinguished Scientist of Cincinnati
Young Engineer
Young Scientist
Professional Accomplishment
Community Service

8:30 P.M. Speakers: Judge Clyde Middleton of N. KY, Mayor Roxanne Qualls, County Commissioner
Guy Guckenberger

Please call Dee Scott at 385-9446 for more information and reservations.

All checks to be mailed to:

Engineers & Scientists of Cincinnati
c/o Dee Scott
P.O. Box 53308
Cincinnati, Ohio 45253

Chairman's Message

By Steve Olenick

This was a surprise to me!! Right here in Cincinnati, a group of UC students, led by Chris Anderson, has been working on a telemetry system for a NASA launch program. Chris, a section member, has graciously offered to present their progress at the March meeting. A more detailed description of this effort will be provided in the March newsletter.

The annual ESC Meeting is scheduled for February 22nd.

Our PACE Chairman, Bill Lohner, has tentatively scheduled a joint meeting with the Dayton Section in May.

If you have any suggestions for technical meetings, please contact me at 513-573-6555 or e-mail me at SOLENICK@CINELE.COM.

Until next time..

A MESSAGE FROM YOUR PACE CHAIRMAN

by Bill Lohner

"A Network of Professional Activities for Engineers"

This message will be the fifth PACE article I have written in the IEEE Cincinnati Section Newsletter. I have requested input from the IEEE membership in all of the articles and have basically received no response. That being the case, I am going to proceed with some ideas of my own.

First, I am going to request funds to bring in a speaker for the April of May IEEE meeting to talk about PACE and what it can do for IEEE members. My current plan is to bring this PACE representative to Cincinnati early enough to talk to myself and Section officers to receive some input to help us run a better IEEE section. He may be able to give us advice on activities or presentations which will be valuable and beneficial to our Section membership. This would be a good time to exchange ideas within our Section officers and bring better participation by our Cincinnati Section membership.

At our regular Section meeting I will request the speaker to make a presentation on what PACE has to offer our members and how PACE can benefit the Cincinnati Section membership. In a future Newsletter, I will present the topics to be discussed by the speaker. A question and answer period would be a part of this presentation. I would like to ask anyone to call or write to me on any IEEE topic they would like to be presented or discussed.

Another area I would like to pursue is local IEEE participation in CAS, "Council for the Advancement of Science", whose purpose is to improve science education in the Cincinnati area high schools. This group will meet February 29th at the Cincinnati Museum of Natural History. PACE does have a slide presentation to present to K-12 students entitled "What is an Engineer?" which the IEEE could present at local high schools. This may be a good activity for "Engineer's Week" which is in February. I will attend this meeting and report back to the Section.

As usual, I will close with the following: Please give me any suggestions or ideas in which the Section can be more helpful to you.

William J. Lohner
PACE Chairman
8703 Indianwoods Drive

CABLE TELEVISION (CATV)

by R. J. Reiman, Historian

E. L. Parsons of KAST, Astoria Oregon, in the summer of 1949, erected an antenna system to receive Station KING-TV, Seattle, from 125 miles away, and he distributed the signal received by coaxial cable to twenty five "subscribing neighbors". This may have been the first installation of Cable Television. The concept spread to small towns in Pennsylvania and Washington.

The growth of CATV can be divided into three phases, the first being the one just described, where the range of local TV is extended to "fill holes" in their normal coverage area created by mountains or other obstructions or interferences. These systems are small, locally owned, and are called "community antenna systems". The second, or "distant station importation", began in the late 1950's, and utilized microwave to transmit signals from broadcast stations to cable systems located far outside their normal service areas. These were first called "community antenna systems" and later "cable television" or "CATV" and a host of regulatory and copyright problems were created and local broadcasters had new competition. The third phase began in the late 1970's with the use of satellites to distribute programs to cable systems. Nationwide distribution of programs that did not originate on TV Stations now became profitable. The development of the third phase increased the size and scope of CATV with 8,500 systems, 42,750,000 subscribers and almost 50 percent of the country's television homes on cable by January 1, 1988.

For a typical cable television system (see Figure 1), signals received either from satellite, microwave, or from a nearby broadcast station, are then processed, combined and fed into a coaxial cable supertrunk. From there, signals are fed into distribution system trunks through a splitter and brought into homes through subscribers drops. The amplifiers must be carefully designed to compensate for greater attenuation of cable at higher frequencies. Cable attenuation is typically 20 times greater at 500 MHz than at 50 MHz. They must also have precise automatic gain control to adjust for temperature variations which affect cable attenuation. The amplifier spacing is a trade-off between noise if the spacing is too great, to cross talk if the spacing is too small. A coaxial cable's high signal attenuation and limited bandwidth preclude the transmission of digital transmission. Special set-top converters are needed on UHF signals because of attenuation limitations.

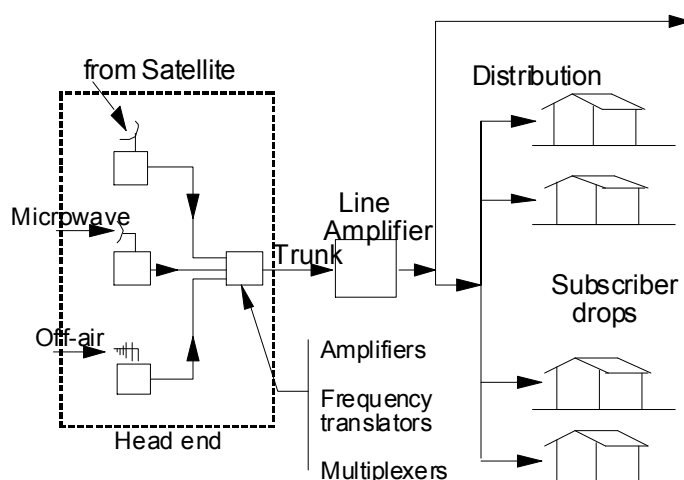


Figure 1 Typical Cable Television System Layout

The solution to attenuation and bandwidth problems lay in the use of fiber-optic cable with an advantage of 10,000 to 1 over coaxial cable, and digital can be used to get noise-free and interference-free reception. The digital to analog converter is expensive for digital, and all analog with a hybrid of fiber on long trunks and coaxial on short simplifies the system. Since fiber-optic systems can handle both telephone and video signals, competition between telephone and CATV is ongoing. Cable broadcasts erode local TV broadcast audience and is a subject of FCC regulation. Direct satellite broadcasting is competition for CATV. Future prospects for CATV include HDTV programs and the prospects are bright.

IEEE NEWS

TECHNICAL EXPERTS AT IEEE BRIEFING DISCUSS HOW TO BRIDGE THE GAP BETWEEN HUMANS AND COMPUTERS

Piscataway, N.J., November 1, 1995 -- You are standing in front of a vending machine at a nearby deserted highway rest area. The machine doesn't take bills and you have no coins. You reach into your pocket, pull out a bank card, slide it into the machine and put it back in your wallet just before sipping that desperately needed cup of hot coffee. You've just used a stored-value card, a convenient replacement for cash being promoted by more than 200 companies belonging to the Smart Card Forum.

Stored-value cards are a kind of smart card that uses very thin microchips to store a predetermined amount of cash for small purchases. A replacement for the common magnetic stripe cards, smart cards are already in use in several countries outside of the United States. Visa will launch them in North America next year at the Olympics in Atlanta. In the next few years, these cards also may be equipped to store such personal data as identification and emergency contact information, medical and insurance records, and bank account data.

Ms. Jean McKenna, vice president of Payment Technologies and chair of the Smart Card Forum, is one of 10 experts who spoke at the IEEE Media Briefing on October 18 in New York. The all-day event, "Humans and Computers: Personalizing Technologies for a New Century," featured speakers who provided information on a range of new and emerging technologies that are moving society to a more convenient and productive world. Summaries of the other presentations follow.

T. V. Raman, Adobe Systems

Have you ever had a conversation with a computer? T. V. Raman at Adobe Systems does every day. Blind since the age of 14, he has developed software for his own use that reads text and mathematical equations with special cues such as tone of voice that make formulas and equations easy to understand. The AsTeR Audio System for Technical Readings produces aural output of typed materials from the same electronic source used to produce the printed documents. Originally designed for mathematicians, the system opens a new world for anyone with a visual impairment.

Andy Hertzfeld, General Magic

Customizing the look and feel of a computer interface so it better meets user needs has been made easier by Magic Cap™ software technology from General Magic. Simply by clicking on a picture or dragging symbols from one point to another, users can add new features, get at information in new ways, or have the software perform functions in a preferred manner.

Network users and third-party programmers can also add new functions without a network overhaul or intervention by the network operator with the company's Telescript™ programming language. This language enables the development of small programs that add flexibility for users and can interact on their behalf in a broad range of networks. General Magic formally announced in October it is releasing the specifications for

Telescript and establishing a World Wide Web site that will enable anyone to execute programs they develop using this technology.

James Comfort, IBM Corporation, T. J. Watson Research Center

Imagine purchasing a portable camera with video and speech playback at 1/10 the cost of a camcorder you purchase today. Advances in silicon technology are likely to make such improvements possible by early in the next decade. By 2001, electronic devices that now require several chips on a circuit board will need just one chip resulting in an increase in truly portable devices with greater performance at a fraction of the cost of today's technology.

Jürgen Heydecke, VARTA Batterie AG

The cellular phone you keep in your briefcase is only as good as the battery that enables it to work. The growing market for such portable electronic products has increased the need for more powerful, longer-lasting power sources. New nickel-metal hydride and emerging lithium-ion battery systems offer lighter weight, smaller dimensions and longer operating times than today's rechargeable Ni-Cd batteries. VARTA Batteries AG, Toshiba and Duracell are working together to develop battery systems that combine these chemical systems with electronics to obtain optimum recharging ability. These technologies will double the operating times of cellular phones and other products and significantly lengthen battery life.

Mark Kryder, Carnegie Mellon University

If you bought a state-of-the-art computer in 1995, it is possible that the hard-disk drive holds twice as much as the computer your brother purchased in 1994. Since 1991, magnetic hard drive technology has advanced very rapidly. Today's drives hold one billion bits of data (one gigabit) per square inch of disk surface on drives as small as three cubic inches. A typical magnetic hard drive can store about 500,000 pages of text. Recording capacity is increasing by 60 percent a year. New technologies have developed that, by the year 2001, may enable disk drives to hold 10 gigabits per square inch.

William Arms, Corporation for National Research Initiatives (CNRI)

Protecting copyrights on the Internet is the subject of much recent debate. It is also the subject of a joint project between CNRI and the Copyright Office of the Library of Congress. The report on copyright registration of electronic documents will be released later this fall. The project includes work on digital signatures to prevent mutation of digital information, a handle system to provide persistent names and secure repositories to manage all kinds of digital-library objects.

Ken Musgrave, George Washington University

Computer artist Kenton Musgrave has developed a technique to build a virtual planet with less than 1,000 lines of computer code using a mathematics technique called fractal geometry. These planets have an unlimited amount of continuous detail that allows a visitor to move about freely. They include realistic terrain that looks like mountains, atmospheric effects such as clouds or rainbows, and textures and depths just like the Earth's. The small size of the program opens up cost-effective possibilities for developing more realistic simulation programs for defense training and other educational applications, and offers exciting alternatives for computer games.

Dudley Childress, Northwestern University Medical School

Electronically-controlled legs with built-in computers that allow an amputee to maintain a "normal" running gait. Computerized systems that enable paralyzed persons to walk. Wheel chairs that can be lowered so a child can play with other children or raised to allow an adult to reach a library shelf. These are just a few examples that show how technology is revolutionizing the possibilities for persons with disabilities. Rehabilitation engineering achievements are extending function despite physical limitations from injury, illness and visual and auditory deficiencies.

Paul Ceruzzi, Smithsonian Institution

How did the computer get to where it is in today's society? When the digital computer was invented, no one imagined that millions of people would communicate on an Information Superhighway. Several crucial turning points in the nature of computing have driven changes in its use. In fact, the computer has reinvented and redefined itself several times during its brief, 50-year history and now presents some new challenges and opportunities.

The IEEE has sponsored the Media Briefing since 1983. The purpose of the event is to provide journalists with information on cutting-edge technologies and perspective on issues that affect technology. The IEEE Foundation has underwritten the event since 1991.

AMERICAN PUBLIC VOICES STRONG INTEREST IN TECHNOLOGY RESEARCH

NEW YORK, October 18, 1995 -- Two out of three of Americans think the U.S. government should increase its spending for research and development in advanced electronics and computer technologies, according to a consumer survey released today by the IEEE.

In the nationwide survey, Americans indicated that advances in these fields could have the highest impact on health and medical care, and education. Nearly 60% of respondents predicted that greater use of advanced technology in these areas could improve the quality of their life in the next 10 years.

The IEEE Technology Attitude and Use Survey, a study of more than 1,000 people across the United States, shows attitudes, perceptions and behaviors concerning the impact of technology on everyday life. The survey also measured usage patterns for computers in the home. The results were announced at the IEEE's 12th annual Media Briefing, held on October 18 in New York.

"At a time when technology funding continues to be attacked in Congress, it's encouraging that the public perceives a need for additional support in this area," said James T. Cain, IEEE president. "People clearly recognize that advanced technology can continue to make significant improvements in their quality of life."

The respondents were somewhat divided on how they can benefit. Nearly 40% believe that technological advances in health and medical care would have more of an impact than advances in education, personal and business communications, entertainment and leisure, pollution control and transportation, respectively.

Most of those surveyed also said that technology has significantly affected the way they work. More than 60% of respondents indicated that Americans are extremely dependent on technology in the work place, and an additional one-third believe that technology is fairly important in their jobs. More than 55% said they know how to operate a personal computer, and 33% have them at home.

In addition, more than 50% of those reporting they have home computers use them for business purposes. Seventy-nine percent of these computer owners also said children in their households use them for homework. Additionally, the study indicated that nearly an equal number of adults and children, approximately 35 percent, also use their PC's for playing computer games. Sixteen percent reported that they communicate through an on-line service or directly on the Internet at home, but only about 2% believe their children go on line.

Survey results also support the notion that males have a better command of technology and use it more than females. This extends beyond computers to VCRs, telephone answering machines, cellular phones and even automated teller machines (ATMs). The gap between the percentage of men and women who reported knowing how to use these technologies ranged from 6 to 16 percent, depending on the device. Among the items

questioned, women and men reported equal knowledge only in how to use the microwave oven. Ninety-one percent of the respondents said they own the appliance, and 91% of both males and females said they knew how to use one.

Despite Congress' declining support for technology research, Americans are showing a somewhat increased confidence in the country's ability to lead the world in technology, compared to an IEEE survey conducted in 1993. Although respondents in the two studies consistently ranked the United States behind Japan, the percentage who say the country is gaining ground has increased by more than 4% in 1995. The number of people who believe the country's technology leadership is slipping also has decreased from 38 to 31 percent.

Confidence levels are strongest among younger respondents who have shown a dramatic change since the earlier poll. In the 18 to 24 age group, the number who said U.S. technological leadership ability is increasing compared to that of Japan, China and Germany has nearly doubled. In addition, those who said the country was slipping in technology leadership declined by more than 11 percent.

The IEEE survey was conducted September 8-10 among 1,020 adults nationwide by Bruskin/Goldring Research, Edison, NJ. For copies of the complete IEEE survey results, please contact Marsha Longshore at 908-562-6824 or m.longshore@ieee.org.

IEEE APPOINTS CECELIA JANKOWSKI MANAGING DIRECTOR, REGIONAL ACTIVITIES

Piscataway, NJ, September 28, 1995 -- Cecelia Jankowski has been appointed by the IEEE as managing director, Regional Activities. She succeeds Melvin Olken, who was recently named executive director of the IEEE Power Engineering Society.

"Ms. Jankowski brings a broad mix of superior technical and management accomplishments from industry and extensive volunteer experience within IEEE to this important position," said Dr. Vijay K. Bhargava, vice president, Regional Activities. "This experience gives her unique understanding of the needs of the Institute and its members around the world, and makes her an especially valuable addition to the staff."

The IEEE's Regional Activities Department provides support to 3,500 volunteers representing 315,000 members in more than 2,000 geographic and student organizations in 150 countries. In addition to overseeing operations, Jankowski will serve as secretary to the Regional Activities Board (RAB).

Prior to joining the IEEE staff, Jankowski was employed by Northrup Grumman in Bethpage NY. She previously participated in Grumman's Outstanding Performer Development Program, gaining extensive experience in business operations and management. She holds more than 10 awards for technical excellence from the IEEE, the American Institute of Aeronautics and Astronautics (AIAA), and Grumman. In 1990, she was named Eta Kappa Nu's outstanding young Electrical Engineer. She holds three patents in digital signal processing.

Jankowski earned a BE in electrical engineering from the State University of New York at Stony Brook and an MSEE from the Polytechnic University in Brooklyn, NY.

She is a Senior Member of the IEEE.

As an IEEE volunteer, Jankowski has served in many positions including chair of the US Activities Board Student Professional Awareness Committee, the PACE Network Regional Activities Committee Chair and a program track chair for Sections Congress '93. She has also been chair of the Long Island Chapter of the Signal

Processing Society, and also is a member of the Aerospace and Electronic Systems, Computer, Engineering Management and Professional Communications Societies.

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Bob Haas - Vice Chairman	231-2584
Orest Melnyk - Treasurer	397-1242
Mark Reineck - Secretary	753-6290
Ron Harbaugh - Member-At-Large	352-6202
Eric Wright - Member-At-Large	881-3329
Jack Beckmeyer - Arrangements Chairman	353-2643, 353-2671 (Fax)
Bill Lohner - PACE Chairman	385-7268
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